

REMARKS

Claims 7 and 14 have been amended to correct an informality in each claim. No new matter has been added. Upon entry of this Amendment, claims 1-16 remain pending.

In the Office Action dated October 5, 2004, claims 1-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Moors et al. (U.S. Patent No. 6,781,673, hereinafter "Moors"). Applicants respectfully traverse this rejection.

Applicants bring to the Examiner's attention that Moors cannot be used as prior art under 35 U.S.C. § 103(a), because Moors only qualifies as prior art under 35 U.S.C. § 102(e), and at the time the invention was made, the present application and Moors were both owned by ASML Netherlands, B.V. (*See*, 35 U.S.C. §103 (c) and MPEP § 706.02(I).) Moreover, Applicants and Moors et al. were all under the obligation to assign the present application and Moors, respectively, to ASML Netherlands, B.V. The instant application is assigned to ASML Netherlands B.V. by way of assignment recorded April 30, 2004 at Reel 015288, Frame 0741. A copy of the Notice of Recordation of Assignment Document is attached hereto.

Moreover, Moors does not teach or suggest all of the features of Applicants' claims. For example, claim 1 recites a lithographic apparatus that includes, *inter alia*, an illumination system that provides a radiation beam, in which the illumination system includes "a radiation-production system that produces extreme ultra-violet radiation, wherein particles produced as a by-product of extreme ultra-violet radiation production move substantially in a particle-movement direction; and a radiation-collection system that collects the extreme ultra-violet radiation, the radiation-collection system being arranged to collect extreme ultra-violet radiation which radiates in a collection-direction, the collection-direction being substantially different from the particle-movement direction."

Moors teaches the use of a particle shield (10) for shielding an object, such as a mask, from stray particles. (Moors, abstract). As taught by Moors, the stray particles receive energy from the EUV projection beam (PBi) and may be driven towards the mask (MA). (Moors at col. 8, lns. 1-24, Fig. 2.) The particle shield (10) establishes an electric field (E) that creates a force on the particles in a direction that is different from the direction towards the mask (MA), thereby preventing the particles from reaching the mask (MA). (Moors at col. 8, lns. 25-67.)

No where does Moors disclose or suggest that the particles in the apparatus are produced as a *by-product* of extreme ultra-violet radiation production and that such particles

move substantially in a particle-movement direction. Instead, Moors teaches that contamination particles may be created, for example, by moving parts of the apparatus, and that particles that are in the apparatus may be driven by the EUV projection beam towards the mask as a result of the EUV projection beam providing energy to the particles. (Moors at col. 8, lns. 14-24.) Such particles are not *by-products* of extreme ultra-violet radiation production, as recited by claim 1.

Moreover, as conceded by the Examiner, Moors does not disclose “a radiation collection system that collects extreme ultra-violet radiation, the radiation collection system being arranged to collect extreme ultra-violet radiation, which radiates in a collection-direction, the collection-direction being substantially different from the particle-movement direction.” (Office Action at page 2.) Applicants respectfully submit that Moors does not suggest this feature either.

The mirrors (143) in the mirror box (140) of Figure 13 that the Examiner considers to “act as radiation collection systems in the same way as the mirrors of applicants’ fig. 5.” The Examiner is clearly using Applicants’ disclosure as a road map in an attempt to equate the features of Applicants’ invention with the features disclosed by Moors. As recited in claim 1, the radiation-collection system is arranged to collect the extreme ultra-violet radiation which radiates a collection direction. Moors does not teach or suggest this feature.

Accordingly, Applicants respectfully submit that claim 1, and claims 2-7 that depend therefrom are patentable over Moors and respectfully request that the rejection be withdrawn.

Claim 8 recites an illumination system that includes, *inter alia*, “a radiation-production system that produces extreme ultra-violet radiation, wherein particles produced as a by-product of extreme ultra-violet radiation production move substantially in a particle-movement direction; and a radiation-collection system that collects the extreme ultra-violet radiation, the radiation-collection system being arranged to collect extreme ultra-violet radiation which radiates in a collection-direction, the collection-direction being substantially different from the particle-movement direction.” As explained above, no where does Moors disclose or suggest that the particles in the apparatus are produced as a *by-product* of extreme ultra-violet radiation production and that such particles move substantially in a particle-movement direction.

Accordingly, Applicants respectfully submit that claim 8, and claims 9-14 that depend therefrom are patentable over Moors, and respectfully request that the rejection be withdrawn.

Claim 15 recites a method for providing a beam of radiation, that includes *inter alia*, “producing extreme ultra-violet radiation and generating particles as a by-product of said production of extreme ultra-violet radiation, said particles moving substantially in a particle-movement direction; and collecting extreme ultra-violet radiation that radiates in a collection direction, said collection direction being substantially different from said particle-movement direction.” No where does Moors disclose or suggest generating particles as a by-product of production of extreme ultra-violet radiation. As discussed above, the particle disclosed by Moors are contamination particles that are in the apparatus.

Accordingly, Applicants respectfully submit that claim 15, and 16 that depends therefrom are patentable over Moors and respectfully request that the rejection be withdrawn.

All rejections and objections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



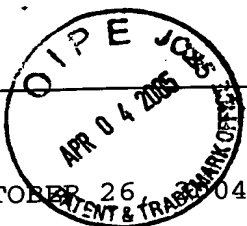
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RECORDATION DATE: 04/30/2004

REEL/FRAME: 015288/0741  
NUMBER OF PAGES: 2

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).  
DOCKET NUMBER: P 307072

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DOC DATE: 04/05/2004

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015288/0741 PAGE 2

SERIAL NUMBER: 10727035

FILING DATE: 12/04/2003

PATENT NUMBER:

ISSUE DATE:

TITLE: LITHOGRAPHIC APPARATUS, ILLUMINATION SYSTEM AND METHOD FOR  
PROVIDING A PROJECTION BEAM OF EUV RADIATION

LENELL MACKALL, SUPERVISOR  
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